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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,314	02/13/2002	Kenji Hoshi	020171	4466

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EXAMINER	
FARAHANI, DANA	
ART UNIT	**PAPER NUMBER**
2891	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/073,314	HOSHI ET AL.	
	Examiner	Art Unit	
	Dana Farahani	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 13-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 13-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/7/28*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 13 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Kepler et al., hereinafter Kepler (US Patent 6,037,671), previously cited.

In regard to claim 13, each of the alignment marks, only the horizontal groups 23, which are explicitly shown as numbered, 23, and have brackets to separate them in sub-groups, all in figure 3, at approximately left half of the figure, are divided by a micronized line and space pattern into a plurality of lines 23a extending along a first direction; and

each of the plural lines is divided into a broken line, that is the segments 23a, having a plurality of segments which are arranged in the first direction only.

In regard to claim 14, positions of the divisions between the plurality of segments of the lines, the aforesaid lines 23 are offset from those of the divisions between the plurality of segments of the adjacent lines, i.e. the vertical lines immediately to the left of the aforementioned lines 23.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated, or in the alternative, under 35 U.S.C. 103(a) as obvious over Kepler.

In regard to the language, "...the micronized pattern having a size smaller than a resolution limit of an alignment sensor...":

(1) no alignment sensor is actually claimed; and

(2) the language reads on a pattern having a size smaller than the resolution limit of any potentially usable alignment sensor, even those sensors with relatively poor resolution limits, such as a human eye.

The language, "pattern forming margin", is interpreted to mean the entire area in which a set of micronized patterns is disposed. Moreover, "device pattern" is interpreted to read on any structure within a device that is formed by patterning: e.g. a gate electrode within a transistor structure.

In regard to claims 1, 15 and 16, Kepler discloses in figure 3, a plurality of alignment marks 23 formed over a semiconductor wafer, each of the alignment marks comprising a micronized pattern with the pattern forming margin of 8 mu (see col. 4, line 47). Kepler also discloses that the alignment marks are formed in the same substrate surface as that in which other IC devices are formed (see col. 1, lines 49 and 50) and also discloses the dimensions of the alignment marks are determined in a particular situation in which they are used (see col. 4, lines 41-43). Kepler does not expressly state that the micronized pattern has a pattern forming margin larger than that of a device pattern. However, since at the time of the invention the device pattern

was in the order of 0.1 mu, Kepler implies that the micronized pattern has a pattern forming margin (i.e. 8 mu) larger than a device pattern.

Alternatively, assuming that Kepler must be interpreted so narrowly as not implying that the pattern forming margin is greater than a device pattern, the claims would not be anticipated. If so, the claims would be nonetheless obvious over Kepler. Specifically, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the device pattern (gate length) smaller than the micronized pattern, because at the time of the invention the use of a gate length on the order of 0.1 mu was the industry standard.

In regard to claim 2, the micronized pattern is a line and space pattern, as can be seen in the figure (i.e. each group of micronized patterns are separated from each other by a space in which no micronized pattern is formed).

In regard to claim 3, each of lines constituting the line and space pattern (i.e. lines 23) are divided in to a broken line having a plurality of segments, that is the segments 23a.

In regard to claim 4, see above, the rejection of claim 14.

Response to Arguments

5. Applicant's arguments with respect to the claims 13 and subseq. have been considered but are moot in view of the new ground(s) of rejection, as discussed in details, above.

Applicants' arguments with respect to claims 1-4 have been considered, but are not persuasive.

Applicants argue that Kepler does not teach the relationship between the size of the micronized pattern and the resolution limit of the alignment sensor. However, because the

resolution limit is claimed to be larger than a resolution limit of an alignment sensor of field image alignment detecting positions of the alignment marks, as explained above, this reads on conventional alignment sensors with even poor resolution limits that ultimately to be used for the alignment marks of the Kepler reference.

Applicants argue that pattern forming margin has a meaning which is different from the Office's interpretation, that is the pattern forming margin is not related with the size of the entire area in which a pattern is formed but is related to the pitch of the pattern. However, the pattern forming margin was not meant to be interpreted the entire area of the patterns, per se, either that of the device or the alignment marks, rather is the distance between the gates of a device, or the distance between the alignment marks, the distance disclosed in the column 4 of the Kepler reference, also discussed above. And, pattern forming margin of the device pattern is interpreted to be the distance between the gates (the scenario explained in the conclusion section), or the length of the gates themselves (i.e. the scenario in the above rejections).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Ema reference (US Patent 5, 874,756) discloses a DRAM in which the device pattern is .3 mu (see col. 55, lines 26-27), in the case that the device pattern is interpreted to mean the distance between the gates. Therefore, even with this interpretation the micronized pattern forming margin would be larger than that of a device pattern.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (571)272-1706. The examiner can normally be reached on M-F 9:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571)272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DF

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